

WHAT IS CLAIMED:

1. A method of calibrating a lithographic projection apparatus comprising:  
generating a first height map of a substrate by measuring a position in a first direction substantially perpendicular to a surface of said substrate of a plurality of points on said substrate surface and simultaneously measuring a position of a substrate holder using a first position detection system, at a measurement station of a lithographic system;  
generating a second height map of said substrate by measuring a position in said first direction of said plurality of points on said substrate surface and simultaneously measuring a position of said substrate holder using a second position detection system, at an exposure station of the lithographic system; and  
comparing said first and second height maps to calibrate said first and second position detection systems.
2. A method according to claim 1, wherein the substrate is a bare silicon wafer.
3. A method according to claim 2, wherein said bare silicon wafer has a surface that is polished.
4. A method according to claim 1, wherein the first and second height maps of said substrate are generated only for strips of the substrate surface which correspond to the measurement ranges of the first and second position detection systems.
5. A method according to claim 1, wherein comparing the first and second height maps comprises determining the difference between the first and second height maps, and storing resulting correction values.
6. A method according to claim 5, wherein the correction values are applied to substrate height maps generated during subsequent production processes.
7. A method according to claim 5, wherein the correction values are used to correct the position detection systems.

8. A method according to claim 1, wherein the first and second height maps are normalised.
9. A method according to claim 1, further comprising:
  - determining static offsets between the first and second height maps; and
  - removing said static offsets.
10. A method according to claim 1, further comprising:
  - repeating a plurality of times said generating a first height map of said substrate, said generating a second height map, and said comparing said first and second height maps, wherein a different tilt is applied to said substrate holder for each repetition.
11. A lithographic projection apparatus comprising:
  - a radiation system constructed and arranged to supply a projection beam of radiation;
  - a first object table provided with a mask holder constructed and arranged to hold a mask;
  - a second, movable object table provided with a substrate holder constructed and arranged to hold a substrate;
  - a measurement station having a first position detection system configured to measure the position of said second object table at said measurement station;
  - an exposure station having a projection system configured to image irradiated portions of the mask onto target portions of the substrate;
  - a second position detection system configured to measure the position of said second object table at said exposure station;
  - a first sensor at said measurement station, said first sensor being arranged to measure the position of the surface of the substrate in a first direction substantially perpendicular to the substrate surface; and
  - a second sensor at said exposure station, said second sensor being arranged to measure the position of the surface of the substrate in said first direction.

12. An apparatus according to claim 11, wherein the first and second sensors are substantially static.

13. An apparatus according to claim 11, wherein the first and second sensors are configured to provide optimal measurements when said substrate is a reference substrate and to provide sub-optimal measurements when said substrate is a production substrate.

14. An apparatus according to claim 13, wherein said reference substrate is a bare silicon wafer.

15. An apparatus according to claim 14, wherein said bare silicon wafer has a surface that is polished.